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Formulation and investigations of lysozyme nanoparticle

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Lysozyme is an alkaline enzyme found mostly in plants, animals, and microbes. It can damage bacterial cell walls by catalysing the hydrolysis of 1,4-b-linkages between muramic acid and N-acetyl glucosamine in mucopolysaccharides and is present in various human tissues and secretions. Therefore, it is widely used as a cell-disrupting and potent anti-bacterial reagent. It is also in high demand due to its unique pharmacological functions such as anti-inflammatory, antiviral, antiseptic, and antineoplastic activities [1]. It is naturally occurring, non-toxic, and easy to digest and absorb.

Nanoparticles can change and improve the properties of proteins such as mechanical, degradable properties and they can protect and control release of the bioactive substances as a delivery system [2].

For the purpose of this research, we carried out pre-formulation experiments by varying factors such as the concentration of the lysozyme and precipitating agent and the pH by using the factorial design method. Based on these variations, different formulations of the lysozyme and precipitating agent were prepared, tested and optimised and the resulting nanoparticles were comprehensively characterised.

Furthermore, Statistica analysis measurements were carried out using the different values for the lysozyme concentration and the sodium sulphate amounts which served as determinant factors for the particle size of the lysozyme nanoparticle solution.

References

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